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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Steve B. Brown, et al

Serial No.: 10/648,626

Filed: 08/25/2003

For: VARIABLE FLEXURE-BASED FLUID FILTER



Attorney Docket No.: IL-11024

Group Art Unit: 1723

Examiner: Krishnan S. Menon

Commissioner for Patents
Alexandria, VA 22313-1450

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Date of Deposit: November 8, 2006

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



Applicant :	Steve B. Brown, et al.	Docket No. :	IL-11024
Serial No. :	10/648,626	Art Unit :	1723
Filed :	08/25/2003	Examiner :	Krishnan S. Menon
For :	VARIABLE FLEXURE-BASED FLUID FILTER		

TRANSMITTAL OF APPELLANTS' BRIEF ON APPEAL
(PATENT APPLICATION - 37 CFR 192)

Transmitted herewith in **duplicate** is the **APPELLANTS' BRIEF ON APPEAL** in this application with respect to the Notice of Appeal filed on September 19, 2006.

The item(s) checked below are appropriate:

1. STATUS OF APPLICANT

This application is on behalf of

☐ other than a small entity.

☒ a small entity.

A verified statement

☐ is attached

☒ already filed.

2. FEE FOR FILING APPEAL BRIEF

Pursuant to 37 CFR 1.17(e) the fee for filing the Appeal Brief is:

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Appeal Brief fee due **\$250.00**

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November 8, 2006

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3. EXTENSION OF TIME

- ☐ Applicant petitions for an extension of time under 37 CFR 1.136

Calculation of extension fee (37 CFR 1.17(a)-(d)):

	Total months <u>requested</u>	Fee for other than <u>small entity</u>	Fee for <u>small entity</u>
<input type="checkbox"/>	one month	\$120.00	\$60.00
<input type="checkbox"/>	two month	\$450.00	\$225.00
<input type="checkbox"/>	three month	\$1,020.00	\$510.00
<input type="checkbox"/>	four month	\$1,590.00	\$795.00
<input type="checkbox"/>	five month	\$2,160.00	\$1,080.00
		Fee	<u>\$000.00</u>

4. FEE PAYMENT

- Charge Account No. 12-0695 in the amount of \$250.00.
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Eddie E. Scott
Agent for Applicant(s)
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Tel. No. (925) 424-6897

Date: November 7, 2006



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on November 8, 2006

Kathy Raymond
Kathy Raymond

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant :	Steve B. Brown, et al.	Docket No. :	IL-11024
Serial No. :	10/648,626	Art Unit :	1723
Filed :	08/25/2003	Examiner :	Krishnan S. Menon
For :	VARIABLE FLEXURE-BASED FLUID FILTER		

Honorable Commissioner for Patents

Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

Dear Sir:

APPELLANTS' BRIEF (37 C.F.R. § 1.192)

This brief is submitted in support of Appellants' notice of appeal from the decision of the Examiner, mailed September 12, 2006 finally rejecting claims 1-10 of the subject application.

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Appellants' notice of appeal was mailed September 19, 2006.

One copy of the brief is being transmitted per 37 C.F.R. § 41.37.



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I. REAL PARTY IN INTEREST

The real party in interest is:

The Regents of the University of California and the United States of America as represented by the United States Department of Energy (DOE) by virtue of an assignment by the inventor as duly recorded in the Assignment Branch of the U.S. Patent and Trademark Office.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

The application as originally filed contained claims 1-21.

The status of all the claims in the proceeding (*e.g.*, rejected, allowed or confirmed, withdrawn, objected to, canceled) is:

Claims 1-10 are rejected, and

Claims 11-21 are cancelled.

The claims on appeal are claims 1-10.

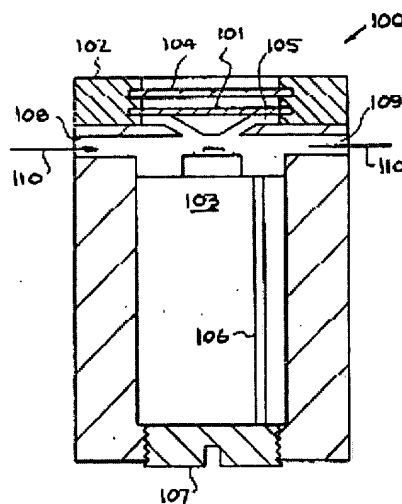
Claims 1-10 on appeal are reproduced in the Appendix.

IV. STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the Final Rejection mailed September 12, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

There is one independent claim involved in the appeal, Appellants' independent claim 1. The invention defined by Appellants' independent claim 1 is variable flexure-based fluid filter apparatus for filtering particles from a fluid. The apparatus comprises a variable flexure-based fluid filter body, a fluid passage in said body, a fluid inlet connected to said fluid passage, a fluid outlet connected to said fluid passage, a flexure unit connected to said passage, an expandable piezo-electric stack connected to said passage and positioned proximate said flexure unit, a variable size passage between said flexure unit and said expandable piezo-electric stack, wherein said piezo-electric stack can be expanded for adjusting the size of said variable size passage for filtering said particles from said fluid and wherein expansion of said piezo-electric stack provides deflection of said flexure unit, a particle sequestering area connected to said fluid passage and located adjacent said flexure unit, said variable size passage, and said expandable piezo-electric stack, and a window in said body operatively connected to said particle sequestering area wherein said window allows visual inspection of said particle sequestering area. The apparatus is illustrated in FIG. 1 from Appellants' original drawings set out below.



Appellants provide a concise explanation of the subject matter defined in independent claim 1 by quoting elements of Appellants' claim 1 and portions of Appellants' specification with the specific portion being identified by the page and line numbers which are enclosed in parentheses. The elements of Appellants' claim 1 are "read on" Appellants' original specification as follows:

Claim 1

Specification

A variable flexure-based fluid filter apparatus for filtering particles from a fluid, comprising:

The structural components of the variable flexure-based fluid filter system 100 include ... (Page 7, lines 1-2)

a variable flexure-based fluid filter body,

structural components of the variable flexure-based fluid filter system 100 (Page 7, lines 1-2)

a fluid passage in said body,

The variable flexure-based fluid filter 100 is equipped with an inlet 108 and an outlet 109. Fluid 110 enters the flexure 101 via the inlet 108 at the bottom of a conical region in the center of the flexure 101. (Page 7, lines 10-12)

a fluid inlet connected to said fluid passage,

Fluid 110 enters the flexure 101 via the inlet 108 at the bottom of a conical region in the center of the flexure 101. (Page 7, lines 11-12)

Claim 1 (Continued)

a fluid outlet connected to said fluid passage,

a flexure unit connected to said passage,

an expandable piezo-electric stack connected to said passage and positioned proximate said flexure unit,

a variable size passage between said flexure unit and said expandable piezo-electric stack, wherein said piezo-electric stack can be expanded for adjusting the size of said variable size passage for filtering said particles from said fluid and wherein expansion of said piezo-electric stack provides deflection of said flexure unit,

Specification

The variable flexure-based fluid filter 100 is equipped with an inlet 108 and an outlet 109. (Page 7, lines 10-11)

The structural components of the variable flexure-based fluid filter system 100 include a stainless steel flexure 101... (Page 7, lines 1-2)

a stainless steel flexure 101 sandwiched between a metal retaining ring 102 and a piezo-electric stack 103. (Page 7, lines 2-3)

The method comprises the steps of introducing an inlet fluid flow stream to a fixture with a variable size passage, and setting the size of the variable size passage so that the fluid passes through the variable size passage but the particles do not pass through the variable size passage. (Page 8, lines 19-23)
In one embodiment the step of setting the size of the variable size passage is accomplished using a piezo-electric stack. (Page 8, lines 23-24)

Claim 1 (Continued)

a particle sequestering area
connected to said fluid passage
and located adjacent said flexure
unit, said variable size passage,
and said expandable piezo-
electric stack, and

a window in said body
operatively connected to said
particle sequestering area
wherein said window allows
visual inspection of said particle
sequestering area.

Specification

The structural components of the
variable flexure-based fluid filter
system 100 include a stainless steel
flexure 101 sandwiched between a
metal retaining ring 102 and a
piezo-electric stack 103. A sapphire
window 104 is also held in place by
the metal retaining ring 102, and
opposes the flexure 101. This
window 104 allows for visual
inspection of the particle
sequestering area 105 during
operation and creates the gap that
determines the size of particle that
will be filtered or trapped. (Page 7,
lines 1-27

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The Final Rejection mailed September 12, 2006 states a single ground of rejection as follows: "claims 1-10 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement." The ground of rejection appears on pages 2-3 of the Final Rejection mailed September 12, 2006. The Final Rejection mailed September 12, 2006 states: "The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In figure 1, the variable size passage between the piezo-electric stack (103) and the flexure member (101) is an annular opening surrounding the conical structure of the flexure, which seems to produce equal gaps between inlet (108) to area (105) and area (105) to outlet

(109). If the gap were too narrow, the particles would not enter the sequestering area (105); if it were too wide, the particles entering the area (105) also would leave; thus area (105) would not function as a sequestering area as claimed. Also the picture is unclear as to how the fluid would be prevented from going around the piezo-electric stack (103) from inlet (108) to outlet (109)."

VII. ARGUMENT

Appellants present arguments directed to the ground of rejection in the Final Rejection mailed September 12, 2006. Appellants' invention of claims 1-10 is described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. A device constructed in accordance with Appellants' invention of claims 1-10 was built and successfully tested prior the filing of Appellants' patent application. Appellants' invention of claims 1-10 operates according to known principles wherein particles enter the particle sequestering area because of their inertia. The fluid makes an abrupt turn but the particles continue into the particle sequestering area.

A Device Was Built And Successfully Tested

A device constructed in accordance with Appellants' invention of claims 1-10 was built and successfully tested prior the filing of Appellants' patent application. That device is illustrated in Provisional Patent Application No. 60/406,191 filed August 26, 2002 and incorporated in the present application by reference. Set out below are pictures from Provisional Patent Application No. 60/406,191 filed August 26, 2002 that show the device constructed in accordance with Appellants' invention of claims 1-10 that was built and successfully tested prior the filing of Appellants' patent application.

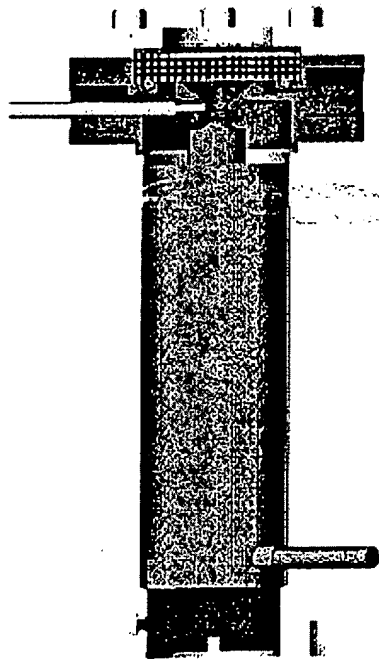


Figure 5: Schematic of Sequestering Cell

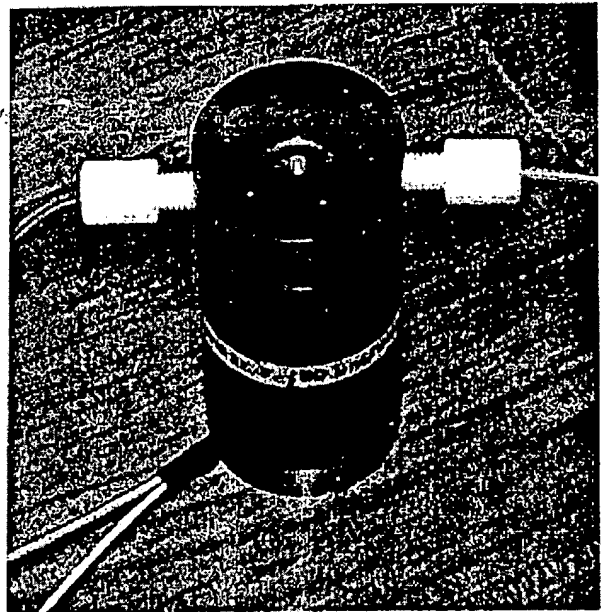
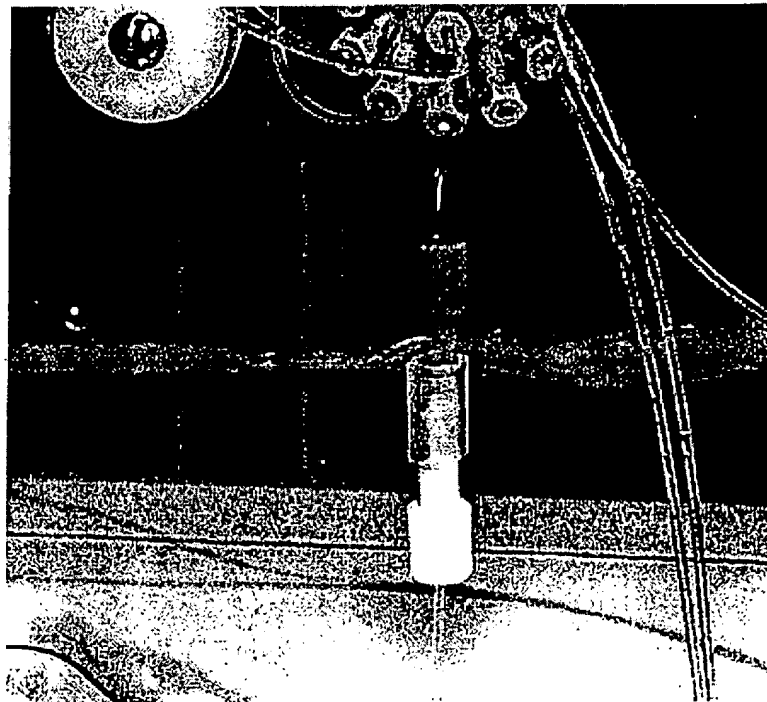


Figure 6: Photograph of Flexure Sequestering Cell



Mk III

Figure 10: Photograph of the filter disk sequestering cell Mk III

Waste

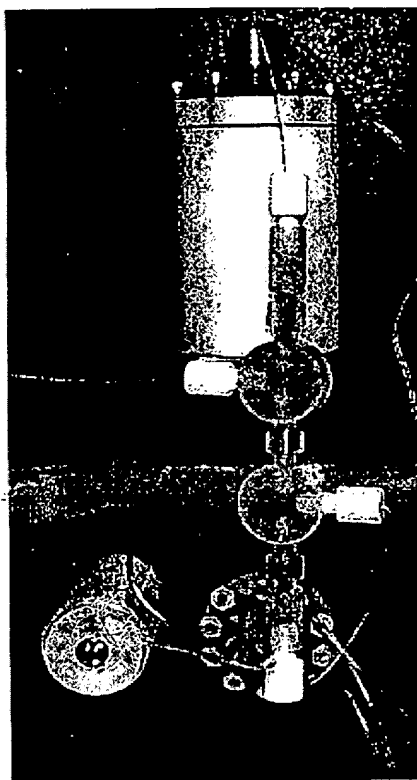


Figure 12: Photograph of coaxial tubular sequestering cell

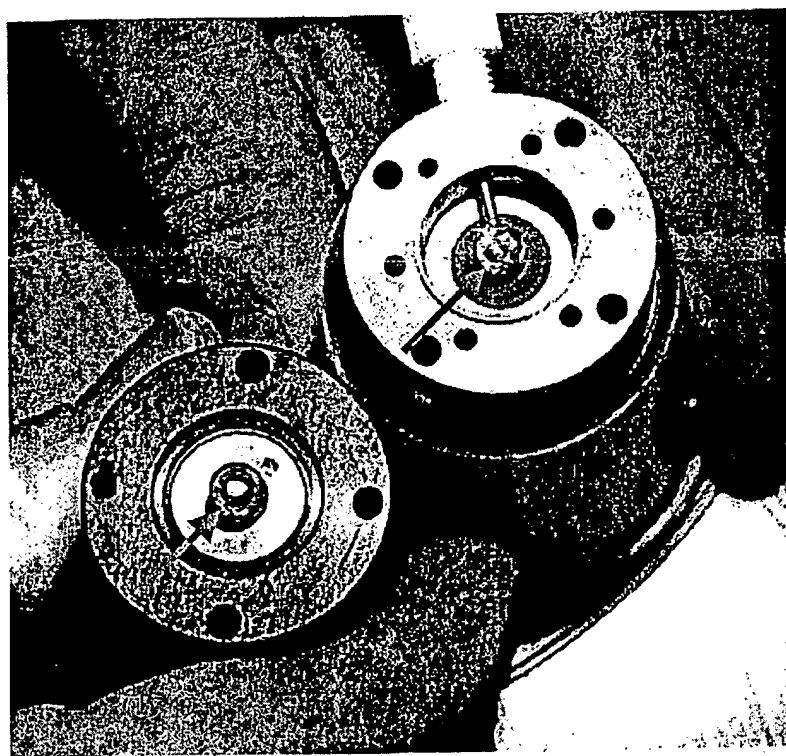


Figure 18: Photograph of the top of the piezo-electric stack and contact point of the flexure showing corrosion

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The conclusions of the testing are summarized on page 29 of Provisional Patent Application No. 60/406,191 as follows:

5 Conclusions

The MEMS sequestering cell can yield good recovery but the repeatability is poor due to problems associated with bubbles sticking in the parallel channels employed in the design tested.

The flexure sequestering cell allows a desired gap to be electronically set. This promises to be useful in bead sequestering and other screening applications. To effectively be used in this fashion, further reductions in dead volume must be attained. In addition, corrosion issues related to a current leak from the piezo stack must be remedied before the flexure is coupled into the device.

With proper choice of membrane material, backing, and support, it appears that an in-line filter can also be employed as a simple sequestering cell. Further work is required to explore Nuclepore filter media.

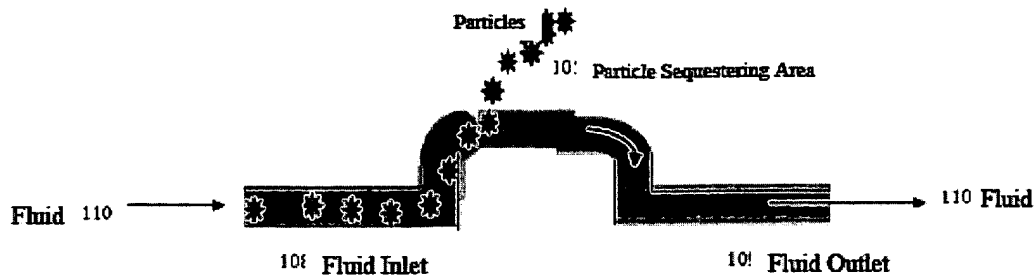
The coaxial tubular bead sequestering cell provides a simple and inexpensive solution to the bead sequestering issue. The device is easy to use. Further optimization testing and long-term performance studies are required. Equipped with this bead sequestering cell, assays requiring wash sequences can now be explored.

The conclusions clearly indicate that a device constructed in accordance with Appellants' invention of claims 1-10 will work. Since the device has been demonstrated to be operable, the Examiner's position that the application fails to comply with the enablement requirement is rebutted.

The fact that a device was constructed in accordance with Appellants' invention of claims 1-10 and successfully tested prior the filing of Appellants' patent application demonstrates that one skilled in the art to which it pertains, or with which it is most nearly connected, could make and/or use the invention.

Device Operates According to Know Principles

Appellants' invention of claims 1-10 operates according to know principles wherein particles enter the particle sequestering area because of their inertia. The fluid makes an abrupt turn but the particles continue into the particle sequestering area. This is illustrated in the sketch below.



The particles enter the particle sequestering area (105) because of their inertia. The fluid (110) makes an abrupt turn but the particles continue into the particle sequestering area (105). This is a known principle of fluids and particles. One skilled in the art to which it pertains, or with which it is most nearly connected, could use the known principle to make and/or use the invention of Appellants' claims 1-10.

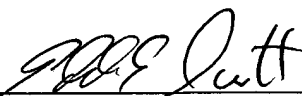
Summary

The rejection of Appellants' claims 1-10 on appeal as failing to comply with the enablement requirement of 35 U.S.C. §112, first paragraph, should be reversed.

Appellants' have shown that the invention of claims 1-10 operates according to known principles and one skilled in the art to which it pertains, or with which it is most nearly connected, could use the known principles to make and/or use the invention. Also the fact that a device of the invention of claims 1-10 was built and successfully tested prior the filing of Appellants' patent application demonstrates that one skilled in the art to which it pertains, or with which it is most nearly connected, could make and/or use the invention based upon what is shown and described in Appellants' specification.

It is respectfully requested that Appellants' claims 1-10 on appeal be allowed.

Respectfully submitted,

By: 

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Date: November 7, 2006

CLAIMS APPENDIX

1. A variable flexure-based fluid filter apparatus for filtering particles from a fluid, comprising:

- a variable flexure-based fluid filter body,
- a fluid passage in said body,
- a fluid inlet connected to said fluid passage,
- a fluid outlet connected to said fluid passage,
- a flexure unit connected to said passage,
- an expandable piezo-electric stack connected to said passage and positioned proximate said flexure unit,
- a variable size passage between said flexure unit and said expandable piezo-electric stack, wherein said piezo-electric stack can be expanded for adjusting the size of said variable size passage for filtering said particles from said fluid and wherein expansion of said piezo-electric stack provides deflection of said flexure unit,
- a particle sequestering area connected to said fluid passage and located adjacent said flexure unit, said variable size passage, and said expandable piezo-electric stack, and
- a window in said body operatively connected to said particle sequestering area wherein said window allows visual inspection of said particle sequestering area.

2. The variable flexure-based fluid filter apparatus for filtering particles from a fluid of claim 1 wherein said flexure unit is a steel flexure unit.

3. The variable flexure-based fluid filter apparatus for filtering particles from a fluid of claim 1 including a strain gauge operatively connected to said

piezo-electric stack and said flexure unit that provides feedback on said deflection of said flexure unit.

4. The variable flexure-based fluid filter apparatus for filtering particles from a fluid of claim 1 including a set screw operatively connected to said piezo-electric stack.

5. The variable flexure-based fluid filter apparatus for filtering particles from a fluid of claim 1 wherein said window operatively connected to said particle sequestering area is located opposite said piezo-electric stack.

6. The variable flexure-based fluid filter apparatus for filtering particles from a fluid of claim 1 wherein said window is a sapphire window.

7. The variable flexure-based fluid filter apparatus for filtering particles from a fluid of claim 1 wherein said variable size passage has a size range to accommodate particles from 1 micron to 500 microns in size.

8. The variable flexure-based fluid filter apparatus for filtering particles from a fluid of claim 1 wherein said variable size passage accommodates particles that are beads.

9. The variable flexure-based fluid filter apparatus for filtering particles from a fluid of claim 8 wherein said beads include optically labeled tags.

10. The apparatus for filtering particles from a fluid of claim 8 wherein said beads include bead surfaces and antibodies or antigens on said bead surfaces.

EVIDENCE APPENDIX

There are no evidence appendix entries.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings appendix entries.